

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

09/509808

| | | |
|---|---|--|
| Applicant's or agent's file reference | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) | |
| International application No. PCT/DE98/03034 | International filing date (day/month/year) 16 October 1998 (16.10.98) | Priority date (day/month/year) 16 October 1997 (16.10.97) |
| International Patent Classification (IPC) or national classification and IPC B27K 5/00 | | |
| Applicant TECHNISCHE UNIVERSITÄT DRESDEN | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 11 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

| | | |
|------|-------------------------------------|---|
| I | <input checked="" type="checkbox"/> | Basis of the report |
| II | <input checked="" type="checkbox"/> | Priority |
| III | <input checked="" type="checkbox"/> | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| IV | <input type="checkbox"/> | Lack of unity of invention |
| V | <input checked="" type="checkbox"/> | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| VI | <input checked="" type="checkbox"/> | Certain documents cited |
| VII | <input checked="" type="checkbox"/> | Certain defects in the international application |
| VIII | <input checked="" type="checkbox"/> | Certain observations on the international application |

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|--|--|
| Date of submission of the demand 03 May 1999 (03.05.99) | Date of completion of this report 01 February 2000 (01.02.2000) |
| Name and mailing address of the IPEA/EP | Authorized officer |
| Facsimile No. | Telephone No. |

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/DE98/03034

I. Basis of the report

1. This report has been drawn on the basis of (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

- ☐ the international application as originally filed.
- ☒ the description, pages 1-7, as originally filed,
 pages _____, filed with the demand,
 pages _____, filed with the letter of _____,
 pages _____, filed with the letter of _____.
- ☒ the claims, Nos. _____, as originally filed,
 Nos. _____, as amended under Article 19,
 Nos. _____, filed with the demand,
 Nos. 1-23, filed with the letter of 04 November 1999 (04.11.1999),
 Nos. _____, filed with the letter of _____.
- ☒ the drawings, sheets/fig 1/1, as originally filed,
 sheets/fig _____, filed with the demand,
 sheets/fig _____, filed with the letter of _____,
 sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☒ the claims, Nos. 24-28
- ☐ the drawings, sheets/fig _____

3. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

see separate sheet

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I. Basis of the report

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3.

- A.1 The applicants have provided no support for the expression inserted in Claims 1-5 "in surface proximity" in the originally submitted application. Because this feature was not originally disclosed, this amendment must be objected to under PCT Rule 70.2(c) and PCT Article 34(2)(b).

The description only supports "at and under the surface" (page 4, line 6 from the bottom and original Claim 7). A melting of areas only beneath the surface without melting at the surface is not disclosed or conceivable.

The claims were interpreted accordingly in the assessment of novelty and inventive step.

- A.2. Substituting "visually" for "clearly" in Claim 3 is not supported by the originally submitted documents. No passages were given in its support. Because this feature was not originally disclosed, this amendment must be objected to under PCT Rule 70.2(c) and PCT Article 34(2)(b).
- A.3. As vague as the term may be, deleting "clearly" from Claims 3-5 remains an inadmissible broadening (PCT Rule 70.2(c) and PCT Article 34(2)(b)).
- A.4. In Claim 7 "additionally (altered)" is missing (PCT Rule 70.2(c) and PCT Article 34(2)(b)).

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I. Basis of the report

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A.5. In Claim 9, the following essential and restrictive features have been deleted: "so that the degree of polymerization of the chains quickly drops off and plasticizing of the material occurs, and the melt solidifies within this period of time".

Consequently, the claim has been inadmissibly broadened (PCT Rule 70.2(c) and Article 34(2)(b)).

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II. Priority

1. ☐ This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit the requested:
☐ copy of the earlier application whose priority has been claimed.
☐ translation of the earlier application whose priority has been claimed.
2. ☐ This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid.

Thus for the purposes of this report, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

see separate sheet

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III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
- ☒ claims Nos. 20-23

because:

- ☐ the said international application, or the said claims Nos. _____
relate to the following subject matter which does not require an international preliminary examination (*specify*):

- ☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 20-23
are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

- ☐ the claims, or said claims Nos. _____ are so inadequately supported
by the description that no meaningful opinion could be formed.
- ☐ no international search report has been established for said claims Nos. _____

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: III.

D.1. Owing to the defects mentioned in Sections A and B concerning novelty and inventive step, the subject matter of Claims 20-23 cannot be meaningfully examined.

D.2. To the extent that they can be understood at all, the subject matter of Claims 20-23 appears to be obvious in light of **D5 (JP-A-09 155814)** (see PAJP and Derwent abstracts and the JP original publication) and **D4 (SU-A-1 790 487)** (Derwent abstract).

i) Both disclose the bonding of wood parts: D5, through hot pressing by **melting** of the hemicellulose and lignin portions, and D8 by the use of other components (metal **particles**). The relevance of **D4** could not be conclusively assessed because it is in Russian.

ii) Both processes lead to aggregates of wood parts, the parts being implicitly connected to each other via geometrically defined melted areas. The absence of pyrolytic decomposition products can be assumed due to the processes used.

iii) No differences were mentioned concerning the properties of the wood melts produced. The process that leads to melting is irrelevant in light of the way in which the claims are currently worded.

D.3. Comments:

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: III.

However, the prior art does not disclose or suggest a process for connecting wood parts or for connecting wood parts and other parts using a process according to Claim 9 (to be clarified).

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|----------------------|-----|
| Novelty (N) | Claims | 1-6, 9-12, 14, 16-19 | YES |
| | Claims | 7, 8, 13, 15 | NO |
| Inventive step (IS) | Claims | 7, 8, 15 | YES |
| | Claims | 13 | NO |
| Industrial applicability (IA) | Claims | 1-19 | YES |
| | Claims | | NO |

2. Citations and explanations

E.1. The following assessment of novelty and inventive step is based on the above-cited lack of clarity and the insufficient delimitation. Positive judgements are only provisional dependent on the corresponding amendments, clarifications and delimitations:

E.2. **D1 (JP-A-60 127102)** (Derwent abstract) discloses a process for applying a specific pattern to a wood-fiber board via laser, in the course of which the cellulose is "melted".

i) Whether or not evidence of pyrolytic decomposition appears obviously depends upon the duration, intensity and kind of laser beam. To this end, see the present description and D6, for example (see Section E.7 below), in which burning and melting during laser treatment of wood is supposed to be avoided.

Accordingly, signs of pyrolysis do not necessarily appear during laser treatment of wood.

ii) Hence, D1 is prejudicial to the novelty of (at least) Claims 1-6 and (at least) implicit for Claims

— 9, 10, 12, 16 and 17 (PCT Article 33(1) and (3)).

A translation of the document was not available at the time this report was produced. Perhaps additional process features may possibly be disclosed in the JP original document (such as pulsed lasers, etc.).

E.3. **D2 (US-A-4 943 700)** discloses the cutting of wood via laser in the course of which the cut face melts and is thereby "sealed" (see D2, column 3, lines 6 and 15-16, column 5, lines 44-45).

i) In **D9 (Holz als Roh- und Werkstoff 40, 1982, pp. 421-28; N. Parameswaran, "Feinstrukturelle Veränderungen an durch Laserstrahl getrennten Schnittfläche..."**, (mentioned in the description), cut wood parts are described that are melted and partly pyrolyzed on the cut face (a "geometrically defined area"); see, for instance, Figures 6 and 7, page 422, Section "3. Ergebnisse", the first three lines.

ii) However, according to D2, a different laser device is used with which "thermic cutting" and "thermic effects" are avoided due to the short pulse times (D2, column 2, lines 8-15). The absence of pyrolytic decomposition products can thus be assumed.

iii) Because the cut surface of the component can be considered a "geometrically defined area", D2 is prejudicial to the novelty of (at least) Claims 1-6, 9-12, 14, 16, 17, 18 and 19 (PCT Article 3(1) and (3)).

E.4. Document **D8 (DE-U-9402681)**, mentioned in the

description, discloses the inscription or ~~melting~~ of an area of workpieces made of wood (among other things) using a pulsed laser beam; see page 5, paragraph 2; page 1, paragraph 2; page 8, paragraph 3; page 4, final paragraph; and claims. Carbonization should be expressly avoided (page 4, line 2).

Hence, D8 also appears to be prejudicial to the novelty of the subject matter of present Claims 1-7, 9-12, 14, 16-19 (PCT Article 33 (1) and (2)).

E.5. Working under inert gas instead of a vacuum, as mentioned for instance in D2, column 3, lines 52-54, is an obvious measure for a person skilled in the art of laser technology (Pct Article 33 (1) and (3)).

E.6. Claims 7, 8, and 15: D1, D2 and D8 do not suggest the simultaneous introduction of additives, because these documents deal with other kinds of goals (PCT Article 33(1) and (3)).

E.7. The following documents mentioned in the search report are of less relevance:

D6 (WO -A-95 25621) (Seltman), and the article mentioned on page 1 of the present description by the same author disclose the brief treatment of cut wood surfaces with a UV laser. Melting and burning of the wood should be avoided (page 3, lines 13-15, page 6, lines 6-9 and Claims 1-4 of D6). The cut remnants are vaporized ("ablated") here; see page 2, line 33, to page 3, line 13, of D6 and photographs in both documents.

D7 (FR-A-2 710 290) discloses wood laminates, the outermost, hydrophobic layer consisting of thermically cross-linked wood (see page 1, lines 16-20). Conventional gluing and pressing of several wood layers produces the laminates.

E.8. The description makes the industrial applicability of the claimed invention clear and requires no further commentary (PCT Article 33 (1)(4)).

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VI. Certain documents cited

1. Certain published documents (Rule 70.10)

Application No.
Patent No.

Publication date
(day/month/year)

Filing date
(day/month/year)

Priority date (valid claim)
(day/month/year)

2. Non-written disclosures (Rule 70.9)

Kind of non-written disclosure

Date of non-written disclosure
(day/month/year)

Date of written disclosure
referring to non-written disclosure
(day/month/year)

see separate sheet

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: VI. and Point II.3

C.1. Certain documents cited (PCT Rule 70.10)

| Application Number | Publication Date | Application Date | Priority Date |
|-----------------------|------------------|------------------|---------------|
| D3 - FR-A-2 751 579 | January 30, 1998 | July 26, 1996 | ----- |
| D3' - WO-A-98/04392 | February 5, 1998 | July 25, 1997 | July 26, 1996 |
| D3'' - EP-A-0 880 429 | December 2, 1998 | July 25, 1997 | July 26, 1996 |

C.2. Documents D3, D3' and D3'' were published **after** the priority date (however, **before** the application date) of the present application, and hence do not belong to prior art under PCT Rule 64.1(b)(ii) and 64.3.

C.3. D3, D3' and D3'' disclose a process for rendering wood parts hydrophobic without cracks occurring, the part first being dried and then brought as a whole up to the glass transition temperature (170-180°C in the examples). The final step is flash heating to give the wood part the desired properties. Accordingly, melting - of the surface as well - must implicitly occur without pyrolytic decomposition; see Examples, page 2, penultimate paragraph and Claim 1 in D3'.

D3, D3' and D3'' disclose at least the subject matter of Claims 1-6.

C.4. In the ensuing regional phases (e.g., before the EPO), D3'' could be used in assessing novelty (e.g., before the EPO pursuant to EPC Article 54(3)).

C.5. This report is based on the assumption that all the claims of the present application enjoy the priority of the filing date of the priority

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: VI. and Point II.3

document. Should this later prove not to be the case, documents D3 and D3', cited in the international search report, could become relevant regarding novelty and inventive step.

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

1. The description either does not acknowledge all of the above-mentioned relevant documents or acknowledges them incompletely (D8) (PCT Rule 5.1 (a)(ii)).

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

- B. The present wording of the current claims is in part unclear and not completely supported by the description (PCT Article 6).
- B.1. Claim 1 contains grammatical errors: ("properties of pyrolytic...free melts").
- B.2. Claims 1 and 9: the description only supports "at **and** under the surface" (page 4, line 6 from the bottom and original Claim 7). A melting of areas solely beneath the surface without melting at the surface is neither disclosed nor imaginable (Support by the description, PCT Article 6).
- B.3. It is not clear why Claim 1 speaks of "areas" and Claim 9 of "volumes" (inconsistent terminology).
- B.4. The application does not make the meaning of "geometrically defined" clear, in particular because such areas also can be "blanket". This feature is at least not suited for delimiting subject matter over the prior art.
Claim 6: where else could the area be but "on and under the surface"?
- B.5. The features listed in Claims 3-5 all appear to be implied by the presence of a fused mass anyway. Even the relative qualifier "clearly" cannot be taken as a distinguishing feature with respect to the prior art.

VIII. Certain observations on the international application

B.6. Claim 7: The following statement is missing
:...(properties **of the areas**..." .

B.7. Use Claims 20-23 are all unclear in several respects
(PCT Article 6) because

i) independent Claim 20 on the other hand refers to
the use of a component according to Claim 1 (i.e.,
with a melt area already solidified) and on the
other is intended to include a connection of
components (plural) by this same melt, i.e.,
untreated components are to be used and connected
through melting;

ii) Claim 20 starts from (implicitly wood)
components, that **each** has a melt area; Claims 21 and
22 on the other hand concern the connecting of wood
to **other** materials (without wood melting areas).

B.8. The description has not been adapted to the amended
claims (PCT Article 6).